

Motorola[®] HOME Radio

SERVICE MANUAL

MODELS
5X11U
5X12U
5X13U
 CHASSIS
HS-243

GENERAL INFORMATION

TYPE - AC-DC table model superheterodyne receiver with loop antenna.

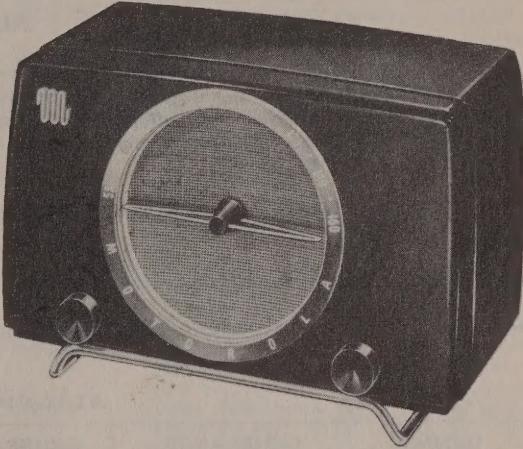
RECEIVER MODELS -

Model	Color
5X11U	Walnut-mahogany
5X12U	Ivory
5X13U	Ebony

TUNING RANGE - 535 to 1620 Kc IF - 455 Kc

TUBE COMPLEMENT - 12BE6 - Converter
 12BA6 - IF Amplifier
 12AT6 - Det, AVC & 1st AF Amp
 50C5 - Power Amplifier
 35W4 - Rectifier

POWER SUPPLY - 117 volts AC or DC, 35 watts



INSTALLATION & OPERATING INSTRUCTIONS

POWER SWITCH AND VOLUME CONTROL. Operated with the left-hand knob. NOTE: Reverse the line cord plug in the wall outlet if radio does not operate from DC. When operating from AC, reversing the line cord plug in the wall outlet may sometimes improve reception.

TUNING. Tune stations with the right-hand knob.

ANTENNA. A built-in loop antenna eliminates the need for an outside antenna in most locations. When receiving a weak station, rotate the receiver slightly for best signal strength. If additional pick-up is necessary, connect an external antenna to the radio by following the instructions printed on the rear panel. CAUTION: Never connect the radio chassis to a water pipe, radiator, or other ground.

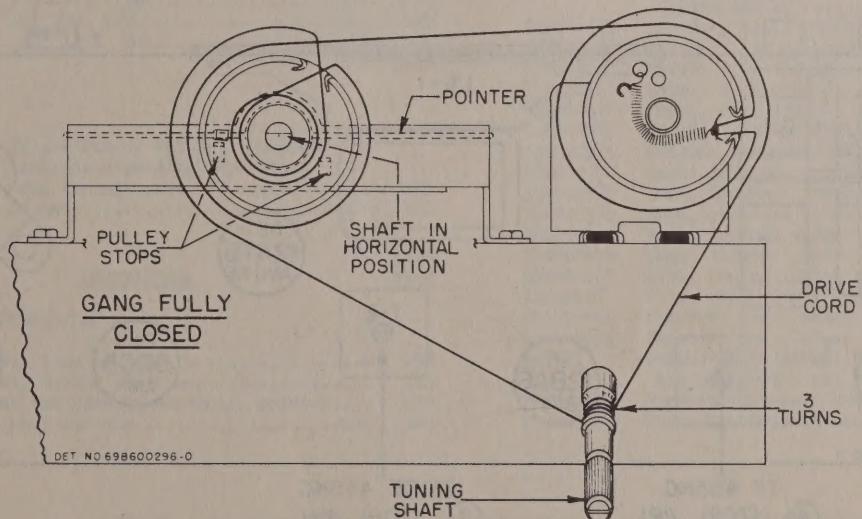


FIGURE 1. STRING DRIVE DETAIL

SERVICE NOTES

The chassis of this receiver is isolated from the AC power line circuit by a capacitor to eliminate the shock hazard when handling the receiver. However, as an additional precaution when aligning or servicing the receiver from AC, an isolation transformer should be inserted between the power line and the chassis.

To remove the chassis from the cabinet:

1. Pull off the two radio control knobs.

2. Pull off the pointer.
3. Remove the split plugs which hold the loop to the cabinet.
4. From the back of the cabinet, remove the two hex head screws at the rear edge of the radio chassis.
5. Slide the radio chassis and loop from the cabinet.

ALIGNMENT

NOTE: It is recommended that an isolation transformer be placed between the power line and the receiver to avoid hum and electrical shocks. If an isolation transformer is not available, connect the low side of the signal generator to B- through a .1 mf capacitor.

1. Connect a low range output meter across the speaker voice coil.
2. Connect the low side of the signal generator to B-.
3. Set the signal generator for 400 cycle, 30% modulation.

4. Turn the receiver volume control to maximum.
5. Use a small fibre screwdriver for aligning the IF and diode transformers.
6. As stages are brought into alignment, reduce the signal generator output to a level which produces less than .40 volts (.05 watt) across the voice coil to avoid overloading the receiver.
7. See Figure 2 for adjustment locations and the following chart for procedure.

ALIGNMENT CHART

STEP	DUMMY ANTENNA	GENERATOR CONNECTION	GENERATOR FREQUENCY	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT 1.	.1 mf	Grid of conv. (pin 7, 12BE6)	455 Kc	Fully open	1, 2, 3 & 4 (IF cores)	Adjust for maximum.
RF ALIGNMENT 2.	-	Grid of conv. (pin 7, 12BE6)	1620 Kc	Fully open	5 (Osc)	Adjust for maximum.
3.	-	Radiation loop*	1400 Kc	Tune for max	6 (Ant)	Adjust for maximum.

*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep loops at least 12" apart.

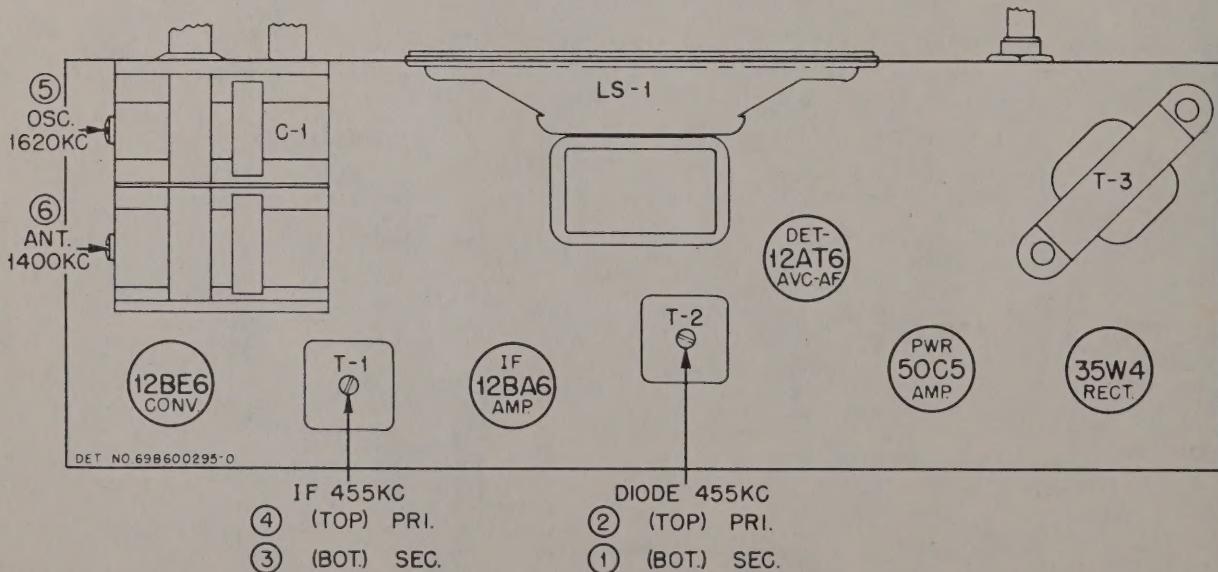


FIGURE 2. TUBE & TRIMMER LOCATIONS

REPLACEMENT PARTS LIST

NOTE: When ordering parts specify model number of set in addition to part number and description of part.

Ref. No.	Part Number	Description	List Price	Part Number	Description	List Price
CHASSIS PARTS - ELECTRICAL						
<u>Capacitors</u>						
C-1	19B600483	Variable, 2 gang: with pulley	2.30	11M8944	Cord, dial: 18 lb black .....	.10
C-2	8R9821	Paper: .05 mf 200V .....	.20	30A470651	Cord, line and plug: 6 ft lg .....	.75
C-3	8R9816	Paper: .05 mf 400V .....	.20	5A19658	Eyelet, spacer (gang mtg) .....	.20
C-4	8R9843	Paper: .15 mf 200V .....	.20	5A70404	Grommet, rubber (gang mtg) .....	.60
C-5	21B482847	Ceramic, multiple: 2000,220,220, 5000 mmf .....	.65	14A482844	Insulator, cord outlet .....	.25
C-6	8A470504	Paper: .25 mf 50V .....	.25	29R3010	Lug, soldering .....	.30
C-7	23B600855	Electrolytic: 50-30 mf/150V	1.10	2S7051	Nut, hex: Palnut (volume control mtg).doz	.15
C-8	8R9802	Paper: .02 mf 400V .....	.20	1X600590	Pulley and Bushing Assembly, pointer drive .....	.25
<u>Capacitor-Resistor</u>						
CR-1	21B601007	2000,110,110,5000 mmf; 6.8 meg, 470,000, 470,000 ohms .....	.85	5S7771	Rivet: .088 x 3/16 stl; nkl pl (tube socket mtg) .....	.50
<u>Coils</u>						
L-1	24C600517	Loop Antenna Assembly: includes back panel	1.00	5S7707	Rivet: .122 x 5/32 stl; nkl pl (tube shield mtg, output transformer mtg and tuning shaft bracket mtg) .....	.50
L-2	24K600812	BC Oscillator .....	.20	3S2294	Screw, machine: 6-32 x 1/2; lock screw; plain hex head; stl; cad pl (gang mtg) .....	.15
<u>Speaker</u>						
LS-1	500691401	Speaker, PM: 4"; 3.2 ohm VC	2.50	3S7477	Screw, machine: 8-32 x 1/4; type #1; plain hex head; stl; cad pl (back mtg) .....	.15
<u>Resistors</u>						
Note: All resistors are insulated carbon type unless otherwise specified.						
R-1	6R6028	22,000 20% 1/2W	1.00	3S2695	Screw, sheet metal: #6 x 3/16 PKZ plain hex head; stl; cad pl (pointer brack- et mtg) .....	.50
R-2	6R6018	100 20% 1/2W	1.00	3S3398	Screw, sheet metal: #6 x 3/8 PKZ plain hex head; stl; cad pl (loop bracket mtg) .....	.50
R-3	6R2118	3.3 meg 20% 1/2W	1.00	3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; stl; cad pl (spkr mtg) ..per/c	.50
R-4	18K600474	Volume control: 1 meg; includes on-off switch	1.00	3S7148	Setscrew: 6-32 x 1/8; Allen head; stl; cad pl (pointer drive pulley retainer) ..	.10
R-5	6R6326	100 10% 1/2W	1.00	47K600506	Shaft, pointer: brass .....	.10
R-6	6R6038	1500 10% 1/2W	1.00	1K600484	Shaft and Pulley Assembly, tuning .....	.20
R-7	6R2109	10 meg 20% 1/2W	1.00	26A481521	Shield, spring (for 12BA6 tube) .....	.50
R-8	6R6032	470,000 20% 1/2W	1.00	9A472534	Socket, tube: 7-prong .....	.15
R-9	6R6038	1500 10% 1/2W	1.00	9K580218	Socket, tube: 8-prong .....	.15
R-10	6R6032	470,000 20% 1/2W	1.00	41A73996	Spring, tension (electrolytic mtg) .....	.05
R-11	6R3992	150 20% 1/2W	1.00	41A14244	Spring, tension (drive cord) .....	.55
R-12	6R5683	27 10% 1/2W	1.00	4K692188	Washer, "C" (tuning shaft retainer and pointer shaft retainer) .....	.20
R-13	6R3953	1000 20% 1W .....	.15	4S7633	Washer, flat: 9/16 x 11/64 x .033 thick; stl; cad pl (loop back mtg) .....	.15
		each	1.45	4K482859	Washer, insulated shoulder .....	.15
<u>Transformers</u>						
T-1,2	24B485553	IF and Diode, 455 Kc: complete including padding capacitors and tuning cores .....	.95	CABINET PARTS		
T-3	25K485973	Output .....	.65	16E600187	Cabinet, table model: walnut-mahogany finish (5X11U)	3.90
<u>Part Number</u>						
<u>Description</u>						
CHASSIS PARTS - MECHANICAL						
7K485971		Bracket, loop back mtg .....	.05	16K600191	Cabinet, table model: ivory finish (5X12U) ..	4.95
7A600476		Bracket, tuning shaft mtg .....	.10	16K600189	Cabinet, table model: ebony finish (5X13U) ..	3.90
X1600589		Bracket and Bushing Assembly, pointer....	.30	13C600416	Bezel, dial (5X11U)	1.50
42A485548		Clip, coil can mtg .....	.20	13K600417	Bezel, dial (5X12U)	1.50
		doz		13K600418	Bezel, dial (5X13U)	1.50
				13B600573	Grille, cabinet (5X11U and 5X12U) .....	.90
				13K600575	Grille, cabinet (5X13U) .....	.90
				36B600570	Knob, pointer: walnut (5X11U) .....	.15
				36K600571	Knob, pointer: ivory (5X12U) .....	.15
				36K600572	Knob, pointer: black (5X13U) .....	.15
				36B600455	Knob, tuning: walnut (5X11U) .....	.10
				36K600456	Knob, tuning: ivory (5X12U) .....	.10
				36K600457	Knob, tuning: black (5X13U) .....	.10
				38A25507	Plug, split (back mtg) .....	.15
				52A600451	Pointer, dial: brass (5X11U and 5X12U)...	.25
				52K600453	Pointer, dial: steel (5X13U) .....	.25
				3S3371	Screw, sheet metal: #8 x 3/8 PKF plain hex head; stl; cad pl (chassis mtg)per/c	.50
				7C600814	Support, cabinet: brass (5X11U, 5X12U)...	.90
				7K600816	Support, cabinet: aluminum (5X13U).....	.95

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SERVICE NOTES

The chassis of this receiver is isolated from the AC power line circuit by a capacitor to eliminate the shock hazard when handling the receiver. However, as an additional precaution when aligning or servicing the receiver from AC, an isolation transformer should be inserted between the power line and the chassis.

To remove the chassis from the cabinet:

1. Pull off the two radio control knobs.
2. Pull off the pointer.
3. Remove the split plugs which hold the loop to the cabinet.
4. From the back of the cabinet, remove the two hex head screws at the rear edge of the radio chassis.
5. Slide the radio chassis and loop from the cabinet.

ALIGNMENT

NOTE: It is recommended that an isolation transformer be placed between the power line and the receiver to avoid hum and electrical shocks. If an isolation transformer is not available, connect the low side of the signal generator to B- through a .1 mf capacitor.

1. Connect a low range output meter across the speaker voice coil.
2. Connect the low side of the signal generator to B-.
3. Set the signal generator for 400 cycle, 30% modulation.

4. Turn the receiver volume control to maximum.
5. Use a small fibre screwdriver for aligning the IF and diode transformers.
6. As stages are brought into alignment, reduce the signal generator output to a level which produces less than .40 volts (.05 watt) across the voice coil to avoid overloading the receiver.
7. See Figure 2 for adjustment locations and the following chart for procedure.

ALIGNMENT CHART

STEP	DUMMY ANTENNA	GENERATOR CONNECTION	GENERATOR FREQUENCY	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT						
1.	.1 mf	Grid of conv. (pin 7, 12BE6)	455 Kc	Fully open	1, 2, 3 & 4 (IF cores)	Adjust for maximum.
RF ALIGNMENT						
2.	-	Grid of conv. (pin 7, 12BE6)	1620 Kc	Fully open	5 (Osc)	Adjust for maximum.
3.	-	Radiation loop*	1400 Kc	Tune for max	6 (Ant)	Adjust for maximum.

*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep loops at least 12" apart.

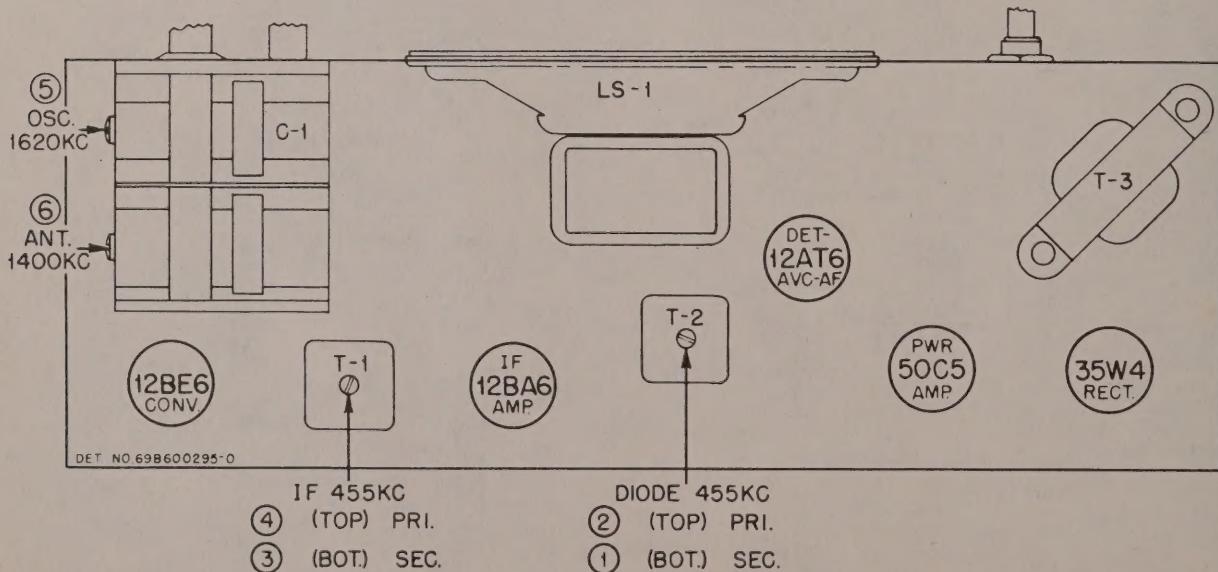


FIGURE 2. TUBE & TRIMMER LOCATIONS

T1 & T2
CONNECTIONS
(BOTTOM VIEW)

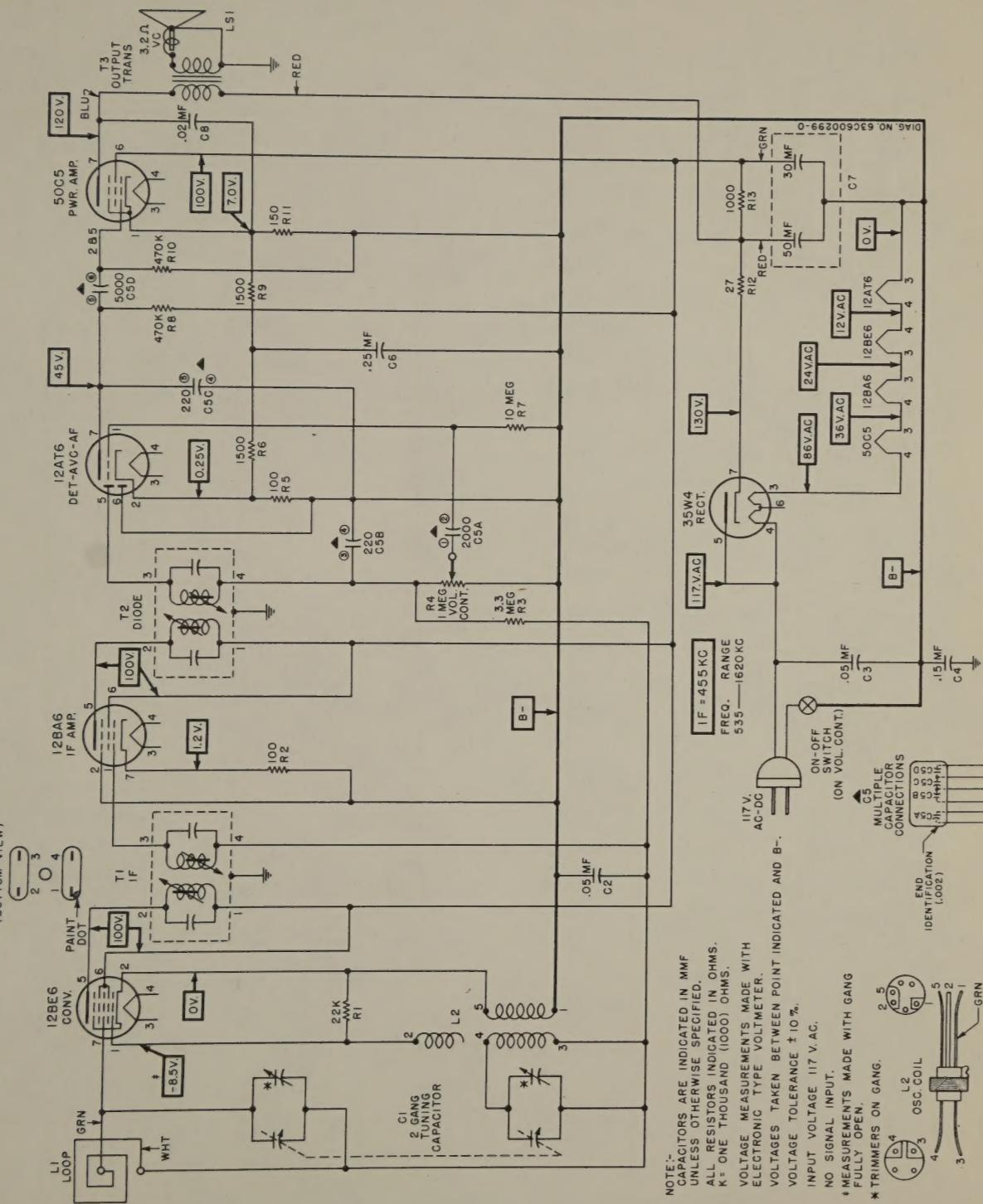


FIGURE 3. SCHEMATIC DIAGRAM OF CHASSIS USING MULTIPLE CERAMIC CAPACITOR

T1 & T2
CONNECTIONS
(BOTTOM VIEW)

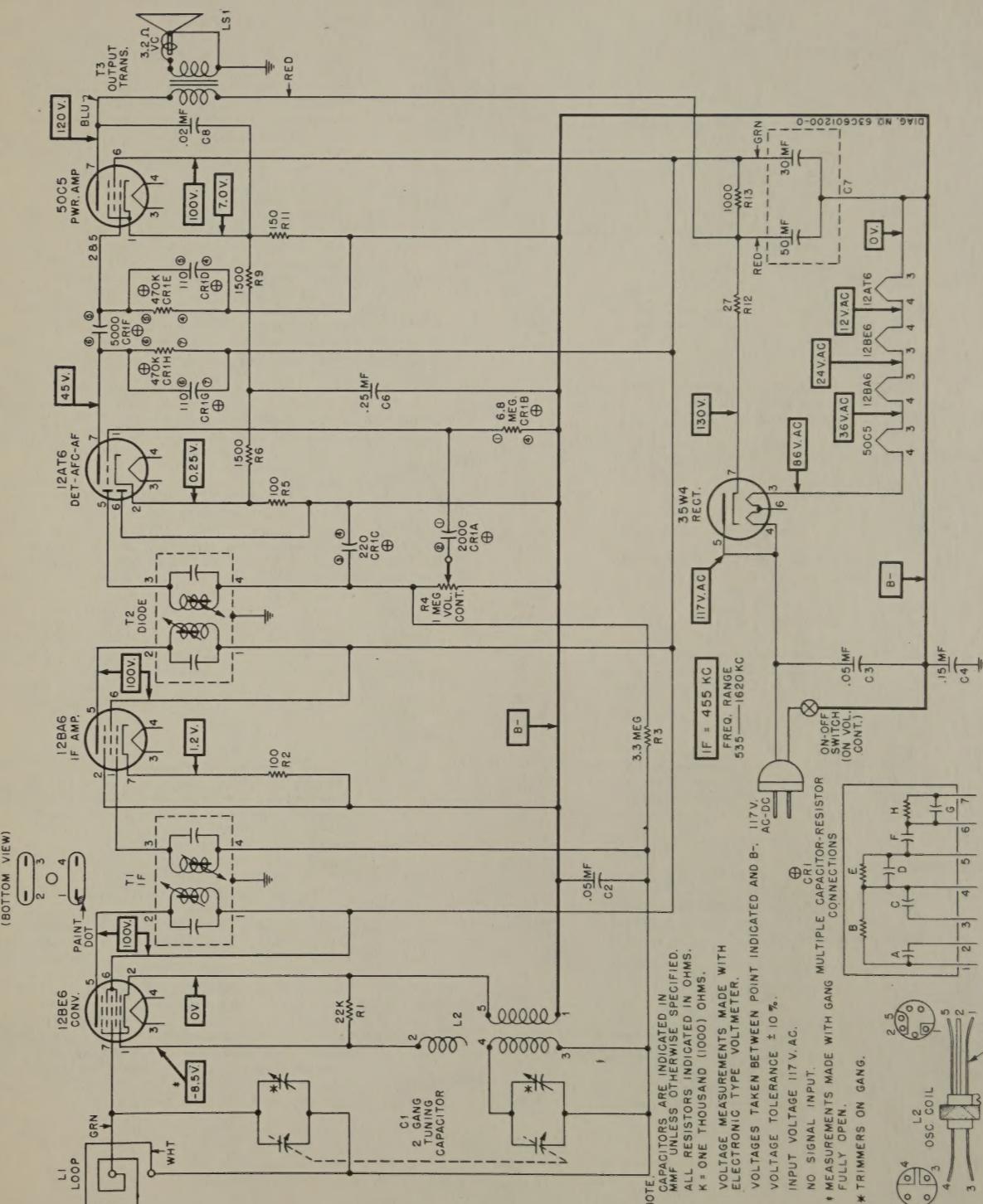


FIGURE 4. SCHEMATIC DIAGRAM OF CHASSIS USING MULTIPLE CERAMIC CAPACITOR-RESISTOR

